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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the application of:		
	Kenneth M. Carson, et al.	Examiner: Hsu, Joni
Serial No.:	10/677,574	Group Art Unit: 2628
Filing Date:	10/01/2003	
For:	OPTIMIZING THE EXECUTION OF MEDIA PROCESSING ROUTINES USING A LIST OF ROUTINE IDENTIFIERS	

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03/19/2009

/J.H./

AMENDMENT AFTER NOTICE OF ALLOWANCE

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Examiner:

This Amendment is filed pursuant to 37 CFR § 1.312 and before payment of the issue fees. Please amend the patent application as follows:

Amendments to the Claims are reflected in the listing of claims, which begins on page 2 of this paper.

Remarks begin on page 8 of this paper.

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application. The following listing provides the amended claims with the amendments marked with deleted material crossed out and new material underlined to show the changes made.

Listing of Claims:

1. – 3. (Canceled)

4. (Previously Presented) A method of processing a plurality of image processing routines on a particular processor using a cache of the particular processor, each routine in the plurality of routines processing at least one frame of video data, the method comprising:

a) determining an initial list comprising a plurality of routine identifiers positioned in a specific order which when executed by the particular processor according to the specific order produce a particular effect, the plurality of routine identifiers identifying the plurality of image processing routines, each routine identifier in the plurality of routine identifiers identifying a corresponding routine in the plurality of routines;

b) grouping at least two routine identifiers of the plurality of routine identifiers into a set of routine identifiers that identify a set of routines;

c) modifying the initial list of routine identifiers to indicate the grouping of the at least two routine identifiers to produce a modified ordering of the initial list of routine identifiers, wherein said grouping and said modifying are performed by a set of instructions executed by the particular processor;

d) executing the routines identified in the modified ordering of routine identifiers by traversing the modified list of routine identifiers to produce the particular effect, wherein said executing comprises executing the identified routines in the modified ordering so that data stored in the cache from at least one previous routine is used for processing a subsequent routine that produces output stored back into the cache; and

e) storing output of the routines to a computer-readable medium.

5. (Currently Amended) The method of claim 4 further comprising:

determining a size of a band of the frames of video data of the set of routines, each frame of video data being comprised of at least two bands where the size of the band is related to a size of the cache; and

modified ordering of the initial list of routine identifiers

wherein executing the routines identified in the modified ~~list~~ ordering of routine identifiers comprises executing the identified routines in two or more passes, a pass of the set of routines comprising each routine in the set of routines performing a single processing pass where the routine processes at least one band retrieved from the cache to produce output data stored to the cache.

6. (Previously Presented) The method of claim 5, wherein determining the size of the band comprises determining the size of a band of the frames of video data so that all data processed by and all output data produced by any routine in the set of routines can be stored to the cache during a single processing pass of the routine.

7. (Previously Presented) The method of claim 5, wherein determining the size of the band comprises determining the size of a band using the following equation:

band size = [(cache size-overhead)/buffer number],

where the cache overhead is memory space in the cache that is unusable to store data of the set of routines and the buffer number is the maximum number of buffers simultaneously accessed by the set of routines if the entirety of each frame of video data of the set of routines were processed in one processing pass of the set of routines.

8. (Currently Amended) The method of claim 4 wherein:

grouping at least two routine identifiers comprises re-ordering a position of a particular routine identifier in the initial list of routine identifiers to produce the set of routine identifiers; and

modifying the initial list of routine identifiers comprises modifying the initial list of routine identifiers to indicate the re-ordering of the particular routine identifier to produce the modified ~~list~~ ordering of routine identifiers.

9. – 25. (Canceled)

26. (Previously Presented) A method of executing a set of at least two image processing routines on a processor using a particular cache, each routine in the set of routines processing at least a frame of video data, the method comprising:

a) determining a size of a band of a frame of video data based on a size of the particular cache, a plurality of buffers referenced within said particular cache by said set of routines, and cache overhead, wherein the cache overhead is memory space in the particular cache that is unusable to store data of the set of routines, wherein the frame of video data is divisible into at least two bands; and

b) executing the set of at least two routines in at least first and second passes to produce a particular effect, wherein the first pass performs a first subset of the set of routines on at least one band retrieved from the particular cache to produce output data stored to the particular cache and the second pass performs a second subset of the set of routines on the output data of the first pass that is retrieved from the particular cache to produce the particular effect that is stored back into the particular cache.

27. (Previously Presented) A method of executing a plurality of image processing routines on a processor using a particular cache by reusing data stored in the particular cache, each routine in the set of routines processing at least a frame of video data, the method comprising:

a) determining a size of a band of a frame of video data, wherein the frame of video data is divisible into at least two bands; and

b) executing the plurality of routines in at least first and second passes, the first pass performing each routine in a first subset of the set of routines on a first band referenced by said routine and retrieved from the particular cache, in order to produce output data stored to the particular cache, and the second pass performing each routine in a second subset of the set of routines on a second band referenced by said routine and retrieved from the particular cache, in order to produce output data stored to the particular cache; and

c) retrieving the output data of the first pass and the output data of the second pass from the cache to derive an output for the image processing.

28. (Previously Presented) The method of claim 27 further comprising determining the size of the band based on a size of the cache.

29. (Previously Presented) The method of claim 28 further comprising determining the size of the band so that all frames of video data processed by and all output data produced by any routine in the set of routines can be stored to the cache during a single processing pass of the routine.

30. (Previously Presented) The method of claim 28, wherein determining the size of the band further comprises determining the size of the band using the following equation:

band size = [(cache size-overhead)/buffer number],

where the cache overhead is memory space in the cache that is unusable to store data of the set of routines and the buffer number is the maximum number of buffers simultaneously accessed by the set of routines if the entirety of each frame of video data of the set of routines were processed in one processing pass of the set of routines.

31. (Previously Presented) The method of claim 27 further comprising the processing of the plurality of bands during a single pass, wherein each band is associated with a separate frame of video data.

32. (Previously Presented) The method of claim 27, wherein the plurality of bands retrieved from the cache are associated with a single frame of video data.

33. (Previously Presented) The method of claim 27, wherein the plurality of bands retrieved from the cache are associated with separate frames of video data.

34. – 44.

45. (Previously Presented) A computer-readable medium that stores a computer program comprising executable code, the computer program for executing a set of at least two image processing routines on a processor using a particular cache, each routine in the set of

routines processing at least a frame of video data, the computer program comprising sets of instructions for:

a) determining a size of a band of a frame of video data based on a size of the particular cache, a plurality of buffers referenced within said particular cache by said set of routines, and cache overhead, wherein the cache overhead is memory space in the particular cache that is unusable to store data of the set of routines, wherein the frame of video data is divisible into at least two bands; and

b) executing the set of at least two routines in at least first and second passes to produce a particular effect, wherein the first pass performs a first subset of the set of routines on at least one band retrieved from the particular cache to produce output data stored to the particular cache and the second pass performs a second subset of the set of routines on the output data of the first pass that is retrieved from the particular cache to produce the particular effect that is stored back into the particular cache.

46. (Previously Presented) A computer-readable medium that stores a computer program comprising executable code, the computer program for executing a plurality of image processing routines on a processor using a particular cache by reusing data stored in the particular cache, each routine in the set of routines processing at least a frame of video data, the computer program comprising sets of instructions for:

a) determining a size of a band of a frame of video data, wherein the frame of video data is divisible into at least two bands; and

b) executing the plurality of routines in at least first and second passes, the first pass performing each routine in a first subset of the set of routines on a first band referenced by said routine and retrieved from the particular cache, in order to produce output data stored to the particular cache, and the second pass performing each routine in a second subset of the set of routines on a second band referenced by said routine and retrieved from the particular cache, in order to produce output data stored to the particular cache; and

c) retrieving the output data of the first pass and the output data of the second pass from the cache to derive an output for the image processing.

47. (Previously Presented) The computer-readable medium of claim 46 further comprising determining the size of the band based on a size of the cache.

48. (Previously Presented) The computer-readable medium of claim 47, wherein determining the size of the band comprises determining the size of a band of the frame of video data using the following equation:

band size = [(cache size-overhead)/buffer number],

where the cache overhead is memory space in the cache that is unusable to store data of the set of routines and the buffer number is the maximum number of buffers simultaneously accessed by the set of routines if the entirety of each frame of video data of the set of routines were processed in one processing pass of the set of routines.

49. (Previously Presented) The computer-readable medium of claim 46, wherein the plurality of bands retrieved from the cache are associated with separate frames of video data.

50. – 51. (Canceled)

REMARKS

This Amendment After Notice of Allowance is filed in response to the Examiner's Amendment that accompanied the Notice of Allowance dated February 23, 2009. In this Amendment After Notice of Allowance, Applicants amend claims 5 and 8 to correct various antecedent basis errors in claims 5 and 8.

Applicants have not added or changed the scope of the allowed claims. Applicants request that the above amended claims be entered pursuant to 37 CFR §1.312.

I. Why the amendment is needed

This Amendment After Notice of Allowance is needed to correct various antecedent basis errors in claims 5 and 8. Specifically, claims 5 and 8 reference "the modified list of routine identifiers". However, the underlying independent base claim 4 references "a modified ordering of routine identifiers". Accordingly, Applicants have amended claims 5 and 8 to correct the antecedent basis error and have claims 5 and 8 reference "the modified ~~list~~ ordering of routine identifiers".

II. Why the proposed amended claims require no additional search or examination

The Examiner has already stated in the Notice of Allowance that claims 5 and 8 are allowed. Therefore, the amendments to correct the various antecedent basis errors in the claims require no additional search.

III. Why the claims are patentable

The Examiner has already stated that the claims as provided above are allowable. Applicants have not added or changed the scope of the allowed claims. Therefore, the claims are patentable.

IV. Why the claims were not presented earlier

Upon receiving the Examiner's Amendment that accompanied the Notice of Allowance, Applicants recognized the antecedent basis errors in claims 5 and 8. Applicants submit this amendment to correct the antecedent basis errors in claims 5 and 8. Accordingly, this amendment is being submitted in compliance with §1.312.

CONCLUSION

Applicants have submitted all known required fees. Accordingly, Applicants believe that no additional fees, extension of time, petition, and/or relief are required for the submission of this Amendment After Notice of Allowance. However, in the unlikely event that the Commissioner determines that additional fees, extension of time, petition, and/or other relief are required, Applicant hereby requests such petition, extension of time, and/or relief and authorizes the Commissioner to charge the cost of such petitions and/or relief to **Deposit Account No. 50-3804** referencing **APLE.P0063**.

Respectfully Submitted,

3/18/2009
Date

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